

Patent Application No. 10/787,371 filed February 26, 2004
Title: Method For Forming Pigment Pseudoparticles
Inventors: BOHACH, William et al.

EXHIBIT A

January 7, 2008 DRAFT - FOR DISCUSSION PURPOSES ONLY

It is understood that this Draft is for discussion purposes only and, in the absence of formal amendment, this Draft does not have the legal effect of amending any of the claims. Thus, while all elected independent claims are shown below in marked-up form, "status identifiers" have not been provided therewith.

1. A method of forming pigment pseudoparticles from pigment particles, comprising: polarizing pigment particles with a gas; and agglomerating the polarized pigment particles to form electrostatically-bound pigment pseudoparticles.

29. A method of forming pigment pseudoparticles from titanium dioxide particles, comprising: providing a hollow vessel having an inner cylindrical surface and containing pigment particles; providing a plurality of paddles that extend inwardly from the inner cylindrical surface; passing a flow of gas through the inner cylindrical surface; axially rotating the inner cylindrical surface, thereby causing the plurality of paddles to lift a portion of the pigment particles; axially rotating the inner cylindrical surface, thereby causing the plurality of paddles to dispense the pigment particles of the dispensed portion being polarized by the gas and landing onto a pile of the pigment particles; and axially rotating the inner cylindrical surface, thereby inducing a repeated avalanching of the polarized pigment particles that agglomerates the polarized pigment particles into electrostatically-bound pigment pseudoparticles.

36. A method of forming pigment pseudoparticles from pigment particles, comprising: providing an inclined hollow vessel having an inner cylindrical surface, a higher inlet end and a lower outlet end; providing a plurality of paddles extending inwardly from the inner cylindrical inner surface and positioned along the axial length of the inclined hollow vessel in a helical formation; introducing the pigment particles into the inclined hollow vessel at the higher inlet end; passing a flow of gas through the inclined hollow vessel in a direction toward the lower outlet end; lifting the pigment particle with the paddles by axially rotating the cylindrical inner surface; dispensing the pigment particles from the paddles by axially rotating the cylindrical inner surface, thereby allowing the pigment particles to fall through the flow towards a portion of the inner cylindrical surface nearer the outlet end while being polarized by the gas; and nucleating the polarized pigment particles into electrostatically-bound pigment pseudoparticles by axially rotating the inner cylindrical surface.

38. An apparatus for forming pigment pseudoparticles from pigment particles, comprising: means for polarizing the pigment particles with a gas; and means for agglomerating the polarized pigment particles into electrostatically-bound pigment pseudoparticles.

41. An apparatus for forming electrostatically-bound pigment pseudoparticles from pigment particles, comprising: a hollow vessel comprising an inner cylindrical surface,

an inlet end, and an outlet end, wherein the hollow vessel is adapted to be positioned in at an incline having the inlet end higher and the outlet end lower; a gas within the hollow vessel; and a plurality of scoops extending inwardly from the inner cylindrical surface and positioned along the axial length of the inner cylindrical surface.

44. An apparatus for inducing electrostatic bonding and agglomeration of pigment particles: a hollow vessel adapted to be rotated in ~~an axial~~ a direction and having an inner cylindrical surface for containing the pigment particles; a plurality of paddles, each of the plurality of paddles comprising an attachment end attached to the inner cylindrical surface, a dispenser end distal the attachment end, and a segment of paddle between the attachment end and the dispenser end, wherein the segment has concave curvature facing the axial direction of rotation; a gas within the hollow vessel; and a means for driving rotation of the hollow vessel.

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EXHIBIT B

January 9, 2008 DRAFT - FOR DISCUSSION PURPOSES ONLY

It is understood that this Second Draft is for discussion purposes only and, in the absence of formal amendment, this Second Draft does not have the legal effect of amending any of the claims. Thus, while all elected independent claims are shown below in marked-up form, "status identifiers" have not been provided therewith.

1. A method of forming pigment pseudoparticles from pigment particles, comprising: polarizing pigment particles with a gas inside a hollow vessel; and rotating the hollow vessel to agglomerate the polarized pigment particles to form electrostatically-bound pigment pseudoparticles.

29. A method of forming pigment pseudoparticles from titanium dioxide particles, comprising: providing a hollow vessel having an inner cylindrical surface and containing pigment particles; providing a plurality of paddles that extend inwardly from the inner cylindrical surface; passing a flow of gas through the inner cylindrical surface; axially rotating the inner cylindrical surface, thereby causing the plurality of paddles to lift a portion of the pigment particles; axially rotating the inner cylindrical surface, thereby causing the plurality of paddles to dispense the pigment particles of the dispensed portion being polarized by the gas and landing onto a pile of the pigment particles; and axially rotating the inner cylindrical surface, thereby inducing a repeated avalanching of the polarized pigment particles that agglomerates the polarized pigment particles into electrostatically-bound pigment pseudoparticles.

36. A method of forming pigment pseudoparticles from pigment particles, comprising: providing an inclined hollow vessel having an inner cylindrical surface, a higher inlet end and a lower outlet end; providing a plurality of paddles extending inwardly from the inner cylindrical inner surface and positioned along the axial length of the inclined hollow vessel in a helical formation; introducing the pigment particles into the inclined hollow vessel at the higher inlet end; passing a flow of gas through the inclined hollow vessel in a direction toward the lower outlet end; lifting the pigment particle with the paddles by axially rotating the cylindrical inner surface; dispensing the pigment particles from the paddles by axially rotating the cylindrical inner surface, thereby allowing the pigment particles to fall through the flow towards a portion of the inner cylindrical surface nearer the outlet end while being polarized by the gas; and nucleating the polarized pigment particles into electrostatically-bound pigment pseudoparticles by axially rotating the inner cylindrical surface.

38. An apparatus for forming pigment pseudoparticles from pigment particles, comprising: means for polarizing the pigment particles with a gas; and means for agglomerating the polarized pigment particles into electrostatically-bound pigment pseudoparticles.

41. An apparatus for forming electrostatically-bound pigment pseudoparticles from pigment particles, comprising: a hollow vessel comprising an inner cylindrical surface,

an inlet end, and an outlet end, wherein the hollow vessel is adapted to be positioned in at an incline having the inlet end higher and the outlet end lower; a gas within the hollow vessel; and a plurality of scoops extending inwardly from the inner cylindrical surface and positioned along the axial length of the inner cylindrical surface.

44. An apparatus for inducing electrostatic bonding and agglomeration of pigment particles: a hollow vessel adapted to be rotated in an ~~axial~~ a direction and having an inner cylindrical surface for containing the pigment particles; a plurality of paddles, each of the plurality of paddles comprising an attachment end attached to the inner cylindrical surface, a dispenser end distal the attachment end, and a segment of paddle between the attachment end and the dispenser end, wherein the segment has concave curvature facing the ~~axial~~ direction of rotation; a gas within the hollow vessel; and a means for driving rotation of the hollow vessel.